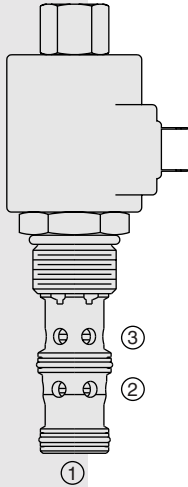


## TS12-36 Proportional Electric Reducing/Relieving

Patent Pending



### DESCRIPTION

A screw-in, cartridge-style, pilot-operated, spool-type reducing/relieving valve, which can be infinitely adjusted across a prescribed range using a variable electric input. Pressure output is proportional to DC current input. This valve is intended for use as a pressure limiting device in demanding applications.

### OPERATION

The TS12-36 allows flow from ② to ① until pressure at ① equals the setting determined by the coil current. Port ③ is typically connected to the reservoir. If external load increases the pressure at ① beyond this setting, pressure is relieved by allowing flow from ① to ③. Minimum pressure at ① without any current is 100 psi.

If external circuitry allows the pressure at ② to fall below the pressure at ①, the valve will allow free flow from ① to ② regardless of the setting of the valve or the amount of current in the coil.

### FEATURES

- Optional airbled screw.
- 12 and 24 volt coils, standard or optional waterproofed.

### RATINGS

**Maximum Operating Pressure:** Ports ① and ②: 276 bar (4000 psi)

**Maximum Tank Pressure:** Port ③: 68.9 bar (1000 psi); Note: Tank pressure is additive to regulated pressure.

**Reduced Pressure Range from Zero to Maximum Controlled Current:**

**A:** 6.9–207 bar (100–3000 psi); **B:** 6.9–172 bar (100–2500 psi)

**C:** 6.9–138 bar (100–2000 psi)

**Maximum Pilot Flow and Leakage:** 0.49 lpm (0.13 gpm) with max. control current and with inlet pressure at 276 bar (4000 psi) at regulated flow of 3.8 lpm (1 gpm).

**Flow Path:** Free Flow: ① to ③ coil de-energized; Reducing: ② to ① coil energized; Relieving: ① to ③ coil energized

**Performance Life:** Less than 5% change in the slope of the pressure vs current characteristics over one million cycles.

**Hysteresis:** Less than 3%.

**Temperature:** -40 to 120°C (-40 to 250°F) with Buna N seals.

**Filtration:** See page 9.010.1

**Fluids:** Mineral-based or synthetics with lubricating properties at viscosities of 7.4 to 420 cSt (50 to 2000 ssu)

**Installation Recommendation:** When possible, the valve should be mounted below the reservoir oil level. This will maintain oil in the armature preventing trapped air instability. If this is not feasible, mount the valve horizontally for best results.

**Cavity:** VC12-3; See page 9.110.1; **Cavity Tool:** CT12-3XX; See page 8.600.1

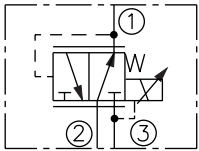
**Seal Kit:** SK12-3X-BM; See page 8.650.1

**Coil Nut:** Part No. 4526330;

For E-coils manufactured prior to 1-1-04, see page 3.400.1 for coil nut info.

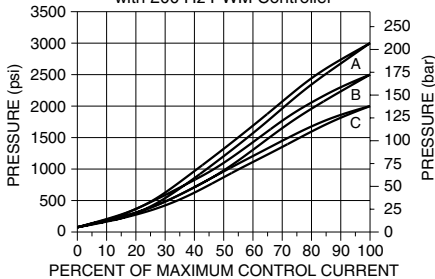
### SYMBOLS

#### USAS/ISO:

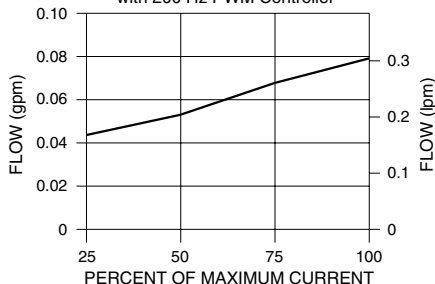


### PERFORMANCE

Reducing Pressure vs. Current for Flow @ 0 gpm; Port 2 to Port 1 with 200 Hz PWM Controller



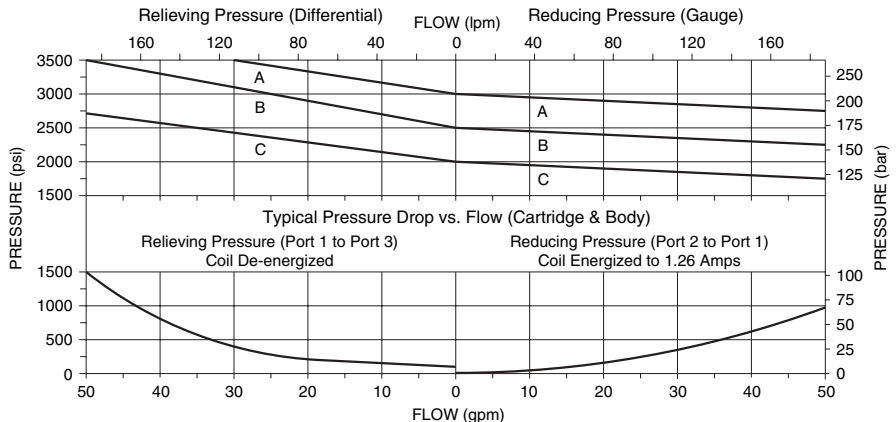
Typical Pilot Flow & Leakage vs. Current  
241 bar (3500 psi) Inlet Pressure at 3.8–37.8 lpm (1–10 gpm) with 200 Hz PWM Controller



Typical Pressure vs. Flow at Maximum Current for Pressure options A, B and C

Body & Line Relieving  $\Delta P$ : 4.5 bar @ 189.3 lpm (65 psi @ 50 gpm)

Body & Line Reducing  $\Delta P$ : 4.8 bar @ 189.3 lpm (70 psi @ 50 gpm)



Typical Pressure Drop vs. Flow (Cartridge & Body)

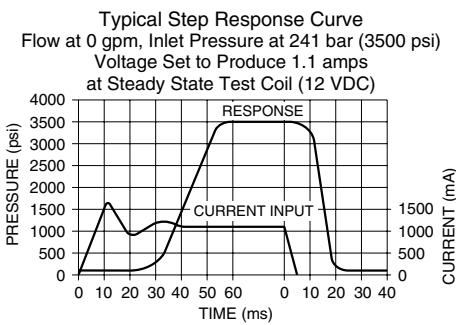
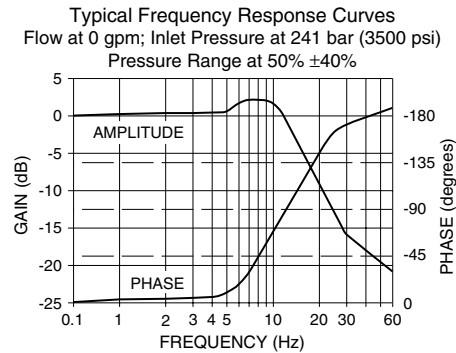
Relieving Pressure (Port 1 to Port 3)  
Coil De-energized

Reducing Pressure (Port 2 to Port 1)  
Coil Energized to 1.26 Amps

# Valve w/Internally Piloted Spool

# TS12-36

## PERFORMANCE (cont'd)

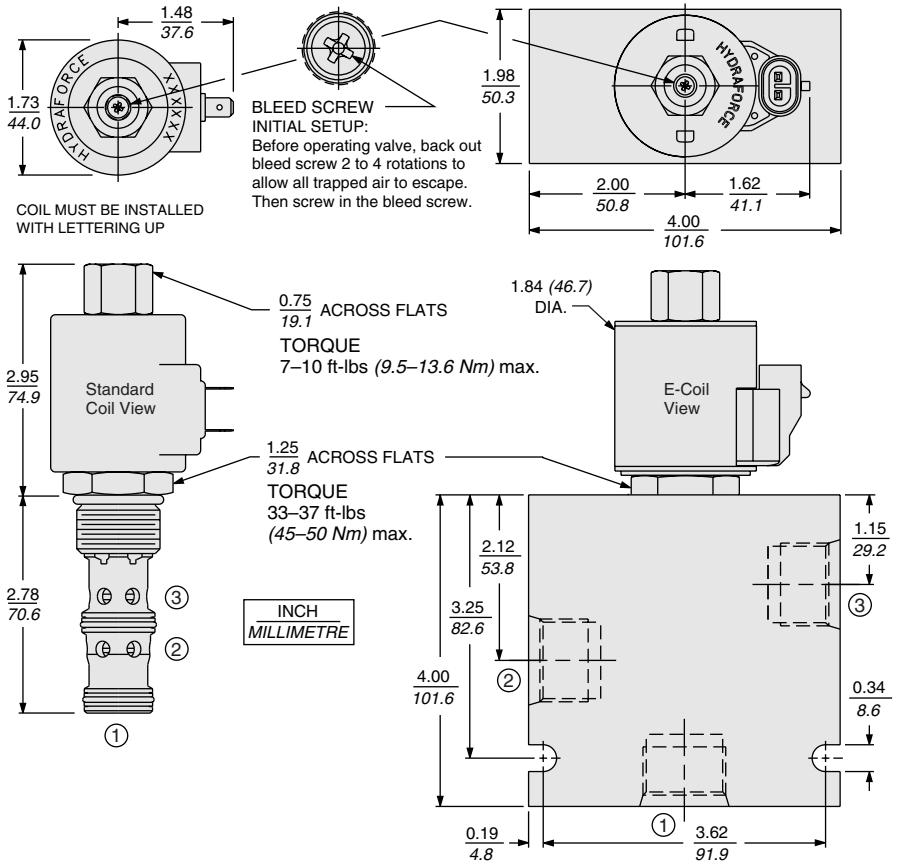


### Recommended Controllers (See Section 3)

| Input Sig. w/12V or 24V Coil | DIN Coil Mount | PCB Board | Metal Box | DIN Rail Mount |
|------------------------------|----------------|-----------|-----------|----------------|
| 0-5 VDC                      | 4000161        | 4000194   | 4000174   | 4000136        |
| 0-10 VDC                     | 4000165        | 4000141   | 4000182   | 4000137        |
| 4-20 mA                      | 4000169        | 4000143   | 4000186   | 4000139        |
| PWM                          | —              | 4000144   | 4000133   | 4000140        |

## DIMENSIONS

Patent Pending



## MATERIALS

**Cartridge:** Weight: 0.30 kg. (0.66 lbs.); Steel with hardened work surfaces. Zinc-plated exposed surfaces. Buna N O-rings and polyester elastomer back-ups standard. Optional polyurethane seals with fluorocarbon back-up recommended for pressures over 240 bar (3500 psi).

**Standard Ported Body:** Weight: 0.23 kg. (0.50 lbs.); Anodized high-strength 6061 T6 aluminum alloy, rated to 240 bar (3500 psi); See page 8.010.1. Ductile iron and steel bodies available; dimensions may differ; consult factory.

**Standard Coil:** Weight: 0.32 kg. (0.7 lbs.); Unitized thermoplastic encapsulated, Class H high temperature magnet-wire; See page 3.200.1.

**E-Coil:** Weight: 0.41 kg. (0.9 lbs.); Fully encapsulated with rugged external metal shell; Rated up to IP69K with integral connectors; **Note: See page 3.400.1 for all E-Coil retrofit applications.**

## TO ORDER

|   |            |   |   |   |   |   |   |
|---|------------|---|---|---|---|---|---|
| <b>TS12-36</b>  |            | - | - | - | - | - | - |
| <b>Maximum Reducing Pressure</b>                          |            |   |   |   |   |   |   |
| 207 bar (3000 psi)  | <b>A</b>   |   |   |   |   |   |   |
| 172 bar (2500 psi)  | <b>B</b>   |   |   |   |   |   |   |
| 138 bar (2000 psi)  | <b>C</b>   |   |   |   |   |   |   |
| <b>Option(s)</b>  |            |   |   |   |   |   |   |
| None (Blank)  |            |   |   |   |   |   |   |
| Bleed Screw   | <b>S</b>   |   |   |   |   |   |   |
| <b>Porting</b>  |            |   |   |   |   |   |   |
| Cartridge Only  | <b>0</b>   |   |   |   |   |   |   |
| SAE 8   | <b>8T</b>  |   |   |   |   |   |   |
| SAE 10  | <b>10T</b> |   |   |   |   |   |   |
| SAE 12  | <b>12T</b> |   |   |   |   |   |   |
| 1/2 in. BSP*  | <b>4B</b>  |   |   |   |   |   |   |
| 3/4 in. BSP*  | <b>6B</b>  |   |   |   |   |   |   |
| <b>Seals</b>  |            |   |   |   |   |   |   |
| N Buna N (Std.)   | <b>0</b>   |   |   |   |   |   |   |
| V Fluorocarbon  | <b>12</b>  |   |   |   |   |   |   |
|   | <b>24</b>  |   |   |   |   |   |   |
| <b>Termination Std. Coil</b>                              |            |   |   |   |   |   |   |
| DS Dual Spades  |            |   |   |   |   |   |   |
| DG DIN 43650  |            |   |   |   |   |   |   |
| DL Leadwires (2)  |            |   |   |   |   |   |   |
| DL/W Leads w/Weatherpak® Connectors                       |            |   |   |   |   |   |   |
| DR Deutsch DT04-2P  |            |   |   |   |   |   |   |
| <b>Termination E-Coil</b>                                 |            |   |   |   |   |   |   |
| ER Deutsch DT04-2P (IP69K Rated)                          |            |   |   |   |   |   |   |
| EY Metri-Pack® 150 (IP69K Rated)                          |            |   |   |   |   |   |   |
| Coils with internal diode are available. Consult factory. |            |   |   |   |   |   |   |
| <b>Voltage</b>  |            |   |   |   |   |   |   |
| Less Coil*  | <b>0</b>   |   |   |   |   |   |   |
| 12 VDC  | <b>12</b>  |   |   |   |   |   |   |
| 24 VDC  | <b>24</b>  |   |   |   |   |   |   |
| * Includes Coil nut.                                      |            |   |   |   |   |   |   |